

Overview of the Therapeutic Effects of *Origanum vulgare* and *Hypericum perforatum* Based on Iran's Ethnopharmacological Documents

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ABSTRACT

Herbs have played an important role in the health and wellness of human beings. Nowadays, medicinal herbs are at the forefront of studies of medical science because of their importance in public health. Understanding the traditional and therapeutic effects of medicinal plants is important because they can be effective as a source of medication. Based on the results obtained from the review of Iran's ethnopharmacological literature, it was found that the *Origanum vulgare* can be used as energy producer, diuretic, stomach booster, nervous system reliever, laxative, anticancer, relief of migraine, fracture healing, numbness of organs, relief of toothache, disinfectant, anticonvulsant, expectorant, analgesic, antitussive, anti-inflammatory, menstrual regulator, decreases urinary tract infection, treatment of sexual dysfunction, colic, sinusitis, cardiac tonic and blockage remover. Also, *Hypericum perforatum* is used as a digestive and nervous system relaxant, respiratory and uterine stimulant, a booster of the immune system, antidepressant, anticancer, anti-AIDS, analgesic, bile cathartic, relaxing, anti-tussive, analgesic, treating nervous system diseases, astringent, antiparasitic, expectorant, diuretic, and blood pressure regulator. Preliminary results presented in this review study enlighten us that the herbal plants could be the basis for experimental and clinical studies to promote the use of natural agents in the treatment of human diseases.

Keywords: Herbal drugs, Laxative, Medicinal plants

INTRODUCTION

Medicinal plants play an important role in the health and well-being of human societies. Information on the use of medicinal plants has been given over the years from one generation to another by our ancestors [1,2]. Medicinal herbs have always been introduced as a safe and affordable source of medicine. Understanding their traditional therapeutic and herbal effects are important because they can be useful as a source of medication. Ethnobotany is the science of studying the relationship between man and plants. This relationship has existed since the beginning of human culture and civilisation. Traditional ethnobotany or botanical studies are those that investigate the traditional therapeutic effects of medicinal herbs in different nations and cultures [3,4]. Herbal flora of Iran is rich. Cultures and tribes inhabiting Iran have customs and practices that use herbs and traditional botany. This is valuable to find new medicinal herbs. Many of the currently used drugs are the result of pharmacological studies in these traditional medicines [4]. In Iran's traditional medicine, many medicinal herbs are used to treat diseases. Two of these herbs include *Origanum vulgare* and *Hypericum perforatum*. In the present study, the medicinal effects of these plants, which are mentioned in the ethnopharmacology and ethnobotany documents of Iran, are to be reviewed.

Marjoram under scientific name of *Origanum vulgare* of the Lamiaceae family is a herbaceous, perennial, and native to Iranian herb that grows in the Northern and Northwest regions of the country, and is known as wild oregano and mountain oregano. *Origanum* genus is divided into 10 sections and 42 species due to its morphological diversity [5,6]. *Origanum* contains only one species titled *Origanum vulgare* L. and six subspecies called *Hirtum* (Link) ssp., *Vulgare* L. ssp., *Virens* v, *Viride* ssp., *Gracile* ssp. and *Glandulosum* ssp. [7-9]. In traditional medicine, this plant is used as antiasthmatic, antispasmodic, sedative and in the treatment of gastrointestinal

disorders including stomach and intestine disorders, constipation and inflation [10,11]. The production of this plant in Germany is 600 tons, in Netherlands 150 tons, in France up to 500 tons and in England 150 tons per year [12].

St. John's-wort with scientific name *Hypericum perforatum* L from Hypericaceae family, is a herbaceous perennial plant that is native to Europe and Asia [13,14]. It is herbaceous with a height of 10 to 110 cm, as well as fluffy flowers with a bright yellow colour, and part of the herbs that use the flowering branches and flowers [15].

It has antidepressant, antiviral, antimicrobial, anti-inflammatory and anti-cancer effects [16]. In traditional medicine, *Hypericum perforatum* is used as an anti-inflammatory remedy for bronchials, bile duct injury, including menstrual bleeding, treatment of various menstrual disorders, vaginal discharge removal, Urinary Tract Infection (UTI), common cold, migraine, headache, sciatica, stomach ulcer, malaria, enuresis, locally for cutting and burning, microbial infections, as well as antidepressant and analgesic [17-21].

Ethnobotanical and ethnopharmacological studies suggest new ideas for researchers to approve these traditional effects in pharmacological studies and to use them to produce drugs and cure diseases [11,17,22-27]. Therefore, the aim of this review study is to identify and introduce therapeutic effects of the plants that are effective, based on ethnobotanical and ethnopharmacological studies. This study reviewed the traditional therapeutic effects of *Origanum vulgare* L. and *Hypericum perforatum* L. in documents and the sources of Iran's ethnobotany.

In the present review, the search was carried out on *Origanum vulgare* L., *Hypericum perforatum* L., ethnobotany, ethnomedicine, Iran and herbs. Ethnobotany articles from different regions of Iran (North, South, East, West and Center of Iran) were collected and the pharmacological effects of these two herbs were recorded [Table/ Fig-1,2] [22-31].

Scientific name	Family name	Parts used	Therapeutic effect	Region
<i>Origanum vulgare</i>	Labiatae	Flowering branches	Energy producer, diarrhea, stomach booster, nervous system reliever, laxative, Reducing the general weakness of the body, anticancer, relief of migraine pain, for external use by rubbing in place of fractures and numbness of body parts and toothache, disinfection	Arasbaran [22]
<i>Origanum vulgare</i> L.	Lamiaceae	Aerial parts	Disinfection, antidiarrhoea, stomach booster, pain reliever	Khoozestan [23]
<i>Origanum vulgare</i> L.	Lamiaceae	Seed	Anticonvulsant, expectorant, pain reliever, anticough, antidiarrhea, anti-inflammatory, nourishing, menstrual regulator, diuretic, anti urinary tract infection	Dashtestane Booshehr [24]
<i>Origanum vulgare</i> L.	Lamiaceae	Aerial parts	Cough relief and treatment of sexual dysfunction	Kazeroon [25]
<i>Origanum vulgare</i> L.	Lamiaceae	Aerial parts	Colic, sinusitis, relaxing, cardiorespiratory booster, nervous system booster and treatment of blockages	Kashan [26]

[Table/Fig-1]: Therapeutic effects of *Origanum vulgare* L. on the basis of ethnobotany and ethnopharmacological documents of Iran [22-26].

Scientific name	Family name	Parts used	Therapeutic effect	Region
<i>Hypericum perforatum</i> L.	Hypericaceae	Flowering branches	Digestive, nervous system relaxing, astringent and booster of respiratory and uterus system, stimulant and nutrient of the immune system, antidepressant, anticancer and HIV virus, pain reliever and bile purgative	Arasbaran [22]
<i>Hypericum scabrum</i> L.	Hypericaceae	Flowering branches	Relaxation, headache and relaxation of the nerves	Ilam [27]
<i>Hypericum perforatum</i> L.	Hypericaceae	Seed, leaf and flowering branches	Anticough	Urmia [28]
<i>Hypericum perforatum</i> L.	Hypericaceae	Flowers	Pain and nervous system disorders	Tuyserkan[29]
<i>Hypericum perforatum</i> L.	Hypericaceae	Aboveground parts	Pain reliever, astringent, antiparasitics, expectorant, diuretic, digestive	Khuzistan [23]
<i>Hypericum perforatum</i> L.	Hypericaceae	Leaf	Blood pressure	Lorestan province [30]
<i>Hypericum perforatum</i> L.	Hypericaceae	Aboveground parts	Headache and relaxing	Maraveh Tappeh [31]

[Table/Fig-2]: Therapeutic effects of *Hypericum perforatum* on the basis of ethnobotany and ethnopharmacological documents of Iran [22,23,27-31].

Traditional Herbal Remedies

Based on the results of the literature review, it was found that *Origanum vulgare* L. and *Hypericum perforatum* L. have valuable and important traditional therapeutic effects on the treatment of various diseases and disorders affecting various organs of the body [22,23]. The information and treatment potentials of *O. vulgare* and *H. perforatum* are respectively shown in [Table/Fig-1,2] [22-26].

DISCUSSION

Ethnopharmacology and ethnobotany studies survey the traditional therapeutic effects of herbs in different nations and cultures. This results in the acquisition of traditional knowledge and effects which provide the basis for scientific studies. Based on the results of present study, it was clear that the medicinal herb *Origanum vulgare* L. and *Hypericum perforatum* L. affect the digestive system, respiratory, nervous, urinary and genital, cardiovascular, skeletal and muscular systems.

Phytochemical analysis of *Origanum vulgare* plant shows that this herb contains thymol, carvacrol, rosmarinic acid, betabisabol, caryophyllene, flavonoids, luteolin, diosmin, tannin and vitamin [32]. Effective combinations of *Hypericum perforatum* include naphthodentron, hypericin, pseudohypericin, acyl-fluoro-glucinol, hyperforin, adhyperforin, xanthones and flavonoids [33]. The therapeutic effects of these plants results from the phenolic, flavonoid, and antioxidant substances of these herbs. Although, other components of the plant might be involved in their effects. These active ingredients have many clinical uses.

Phenolic compounds are mostly, plant secondary metabolites with a large structure diversity, from simple structures such as phenolic acids to polyphenols (such as flavonoids) and polymeric compounds. Phenolic compounds are also synthesised or semisynthesised industrially. Most of the phenolic compounds are soluble in water; however, the smaller ones are most volatile. Natural phenolic compounds mostly interact with other substances. Although phenolic compounds, especially flavonoids have antioxidant

activities, they are largely reactive species toward oxidation [34-41]. Both of these plants have antioxidant activity and can scavenge free radicals and reduce oxidative stress. Oxidative stress is the cause of various diseases and disorders including cardiovascular, central nervous, inflammation, neurodegenerative diseases and development of cancer especially age related cancers. Antioxidants have been shown to counteract the effects of free radicals, preventing or imposing therapeutic effects against these and other oxidative stress diseases [42-44].

Oxidative stress is especially important in neurodegenerative diseases such as Huntington's disease, Parkinson's disease, Alzheimer's disease, multiple sclerosis, autism and depression [45,46]. Reactive oxygen species and reactive nitrogen species causing oxidative damage have been suggested to have a crucial role in the pathogenesis of these diseases. In this regard, cumulative oxidative stress with mitochondrial damage and disrupted mitochondrial respiration co-relates with neurodegenerative diseases, especially with Parkinson's disease and Alzheimer's disease [47].

In regard to oxidative stress and certain cardiovascular disease, oxidation of Low Density Lipoprotein (LDL) in endothelium is an important precursor of plaque formation and atherosclerosis. [48]. Oxidative stress also plays a role in the ischemic cascade due to oxygen reperfusion injury following hypoxia. This cascade includes both strokes and heart attacks. Oxidative stress has also been implicated in chronic fatigue syndrome [49]. Oxidative stress also contributes to tissue injury following irradiation and hyperoxia, as well as in diabetes. Oxidative stress is involved in cancer development too. The reactive species damage the DNA, hence they are considered as mutagens. *Helicobacter pylori* infection which enhances production of reactive species in human stomach is also an important factor in the gastric cancer development [50].

Medicinal plants have fewer side effects than chemical drugs and people tend to have it more [51]. The plants of *Origanum vulgare* are used in traditional Iranian medicine as slimming medicine. *Hypericum perforatum* plant is now used as a herbal remedy for

depression. Also, in the Iranian drug market, drops of *Origanum vulgare* essential oil are used as an opening for the ear canal. *Hypericum perforatum* herbs are useful for the treatment of mild and transient depression and do not have harmful side effects of chemical drugs.

These two plants by their antioxidant activities are able to scavenge free radicals and prevents diseases. These two plants may have other therapeutic or preventive effects which should be examined further.

CONCLUSION

The plants *Origanum vulgare* and *Hypericum perforatum* have various therapeutic effects as well as antioxidant activities. Due to the latter effects, they may have a lot of other unknown properties which should be evaluated. It is recommended that the active ingredients of these herbs be reviewed for their effects on diseases and disorders mentioned above so that they can be used to produce natural and effective medicines.

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